UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

May 1, 2007

Tennessee Valley Authority
ATTN: Mr. Preston D. Swafford
Interim Chief Nuclear Officer
and Senior Vice President
6A Lookout Place
1101 Market Street
Chattanooga, TN 37402-2801

SUBJECT: BROWNS FERRY NUCLEAR PLANT - NRC OPERATIONAL READINESS ASSESSMENT TEAM (ORAT) INSPECTION REPORT 05000259/2007006

Dear Mr. Swafford:

On April 28, 2007, the United States Nuclear Regulatory Commission (NRC) completed an inspection at your Browns Ferry Unit 1 reactor facility. The inspection was conducted by senior inspectors from each of the four NRC Regional Offices. The inspection evaluated activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license, including management controls, implementation of site processes, material condition, and personnel readiness to support safe startup and the return to power operation of the Unit 1 facility. The enclosed inspection report documents the inspection results, which were discussed on April 27, and April 30, 2007 with you and other members of your staff.

The inspection focused on the adequacy of resources needed to support Unit 1 operation, and implementation of site programs affected by the addition of a third operating unit at Browns Ferry. The inspection did not evaluate the adequacy of programs themselves, such as the corrective action program, licensed operator training program, and plant-specific probabilistic risk analysis, since those programs have been in place for the currently operating Units 2 and 3, or where extensive prior inspection has evaluated the program or process. Each of the five inspection focus areas, which included management oversight, control of safety significant activities, operations training and experience, corrective action program implementation, and maintenance support activities, were evaluated as adequate to provide assurance to the NRC that Tennessee Valley Authority had adequately prepared Browns Ferry for a return to three unit operation. The licensee's performance was consistent with that of current operating reactors, and activities observed demonstrated that adequate controls were used to successfully exhibit readiness for the facility and staff to safely startup and conduct power operations of the Unit 1 facility.

The results of the inspection will be considered by the Browns Ferry Restart Oversight Panel, which will then consolidate the inspection results with those of past inspections, as well as any remaining planned inspections, prior to providing a recommendation to the Regional Administrator, NRC Region II, for authorization to restart Browns Ferry Unit 1.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure and your response, if any, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Malcolm T. Widmann, Chief
Reactor Projects Branch 6
Division of Reactor Projects

Docket No.: 50-259
License No.: DPR-33

Enclosure: Inspection Report 05000259/2007006 w/Attachment: Supplemental Information

cc w/encl.: (See page 3)

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Distribution w/encl: (See page 4)

Report to Preston D. Swafford from Malcolm T. Widmann dated May 1, 2007

SUBJECT: BROWNS FERRY NUCLEAR PLANT - OPERATIONAL READINESS ASSESSMENT TEAM INSPECTION REPORT 05000259/2007006

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U.S. NUCLEAR REGULATORY COMMISSION
REGION II

Docket No.:	50-259
License No.:	DPR-33
Report No.:	05000259/2007006
Licensee:	Tennessee Valley Authority (TVA)
Facility:	Browns Ferry Nuclear Plant, Unit 1
Location:	Corner of Shaw and Nuclear Plant Roads Athens, AL 35611
Dates:	April 23-28, 2007
Inspectors:	Ryan Lantz, Senior Operations/Emergency Preparedness Inspector, Region IV (Team Lead) Randal Baker, Resident Inspector, Duane Arnold, Region III Tim Hoeg, Senior Resident Inspector, St. Lucie, Region II Scott Freeman, Senior Resident Inspector, Sequoyah, Region II Gordon Hunegs, Senior Resident Inspector, FitzPatrick, Region I Larry Mellen, Senior Project Engineer, Branch 6, Region II Bobby Holbrook, NRC Contractor
Approved by:	Malcolm T. Widmann, Chief Reactor Project Branch 6 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000259/2007006; 04/23/2007 - 04/28/2007; Browns Ferry Nuclear Plant, Unit 1; Operational Readiness Assessment Team Inspection.

The report covered a one week period of inspection by inspectors from all four NRC regional offices, including a senior Region IV operations/emergency preparedness specialist, a senior resident inspector from Region I, a resident inspector from Region III, two senior resident inspectors from Region II, one senior project engineer from Region II and one contractor. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, Reactor Oversight Process, Revision 3, dated July 2000.

Unit 1 Operational Readiness Assessment

The Browns Ferry Units had been shutdown by the Tennessee Valley Authority (TVA) since March 1985. The units remained shutdown until the restart of Unit 2 in May 1991, and Unit 3 in November 1995. Based on the lack of findings during the inspection, and good performance observed in all of the inspection focus areas, the inspectors determined that the Unit 1 facility had prepared adequately for startup and return to power operation. The remaining material condition and work items identified to be accomplished prior to Unit 1 restart were being adequately tracked and completed as projected. At the completion of the inspection on April 28, 2007, approximately 1600 individual activities that would require an estimated ten working days to complete remained to be accomplished prior to restart of the Unit 1 facility. Completion of these items would be controlled through normal site refueling outage processes.

Management activities at Browns Ferry were effective at providing oversight of significant activities and supportive to supply the necessary resources for a safe recovery and restart of Unit 1. Management meetings were effective at evaluating problems, assigning priorities, and setting standards. Management observation activities generally provided useful feedback to line personnel and reinforced expectations and standards. Interviews with line personnel indicated that TVA corporate and Browns Ferry site management provided adequate resources during the recovery of Unit 1 to both effectively prepare Unit 1 for restart to power operation, and the Browns Ferry site for three unit operation.

Safety significant activities were adequately scheduled, conducted, observed, and documented. System status, including current configuration and design, was adequately controlled and monitored. The inspectors observed professional decorum in the Units 1 and 2 control room, and proper prioritization of work which minimized distractions to the operating crews. Engineering support for Operations, including system engineering activities, were adequately conducted.

Training activities adequately prepared licensed and non-licensed operators for startup and power operation of Unit 1, especially related to differences between Unit 1 and the operating units. Unit 1 operating procedures and drawings were adequately revised to account for Unit 1 differences. Licensed operator resources were adequate to staff all operating shifts for three unit operations, and actual staffing exceeded minimum Technical Specification and Emergency Plan requirements.

The incorporation of Unit 1 specific problems and corrective action tracking into the site corrective action program were evaluated as adequate. Problems identified in site operational readiness assessments, system walkdowns, and other activities were adequately documented and evaluated for root causes and corrective actions. The site corrective action program fully implemented responsibility

for Unit 1 issues. Operability issues and deferred testing requirements identified for safety-significant systems were adequately tracked and corrected in the site corrective action program.

Maintenance support activities were performed adequately. The maintenance organization was adequately trained and staffed for a three unit operating site. Maintenance metrics were effective at monitoring performance. Assessments of maintenance programs were critical and thorough. The quality of maintenance observed was adequate and consistent with the quality of maintenance at other operating plants.

The inspectors observed safe operation of Unit 1 during testing and continuing recovery work activities. The inspectors evaluated the operation of Unit 1, in conjunction with the concurrent safe operation of Units 2 and 3 at power, to be consistent with observations at a three unit operating site with one unit recovering from a normal refueling outage. Unit 1 was fully integrated into and utilized the same programs, procedures, and personnel that are used to safely operate Units 2 and 3. The overall level of performance observed was considered adequate for operations. The team concluded that the licensee had adequately addressed and implemented the Unit 1 recovery, and that the site programs, personnel, and procedures were adequate for the restart of Unit 1, and three unit power operations.

REPORT DETAILS

4. OTHER ACTIVITIES

The purpose of this operational readiness team inspection was to provide an independent assessment of management controls, implementation of site programs, and personnel readiness to support safe restart and operation of the Unit 1 facility. The inspection did not evaluate the adequacy of the various programs themselves since both operating Units 2 and 3 are successfully using those programs and remain in the licensee response band of the Reactor Oversight Process action matrix. The scope of the inspection was adjusted to limit repetition of prior inspection activities, as well as remove inspection elements that would be performed during restart operations. The inspection focused on the ability of the license to continue successful implementation of those programs with the addition of a third operating unit, especially with respect to adequacy of personnel resources. The team also sampled safety significant system status, including material and procedural readiness to support engineering, maintenance, and normal, abnormal, and emergency operations.

4OA5 Other Activities

A. EFFECTIVENESS OF MANAGEMENT OVERSIGHT

A.1. Management Review Meetings and Oversight Committees

a. Inspection Scope

The inspectors assessed the effectiveness of management meetings and oversight committees to provide direction, priorities, standards, and resources for the safe recovery of Unit 1 for restart.

The inspectors attended daily site management status and planning meetings, which included plan of the day meetings, TVA Nuclear (TVAN) corporate morning status conference calls, management review committee meetings, Unit 1 outage schedule meetings, and General Manager staff meetings.

The inspectors observed the site assessment of daily issues and problems associated with Unit 1, compared the treatment of those issues to the assessment of Unit 2 and 3 issues, and evaluated these practices against the management expectations and guidelines in licensee procedures, TVAN Standard Programs and Processes (SPP)-10.0, “Plant Operations,” Revision 3, and TVAN Business Practice (BP)-250, “Corrective Action Program Handbook,” Revision 12.

The inspectors also attended management oversight decision making and review meetings, which included a plant operations review committee meeting, the weekly critical evolutions review meeting for high risk evolutions, and an emergent real-time critical evolution meeting.

The inspectors observed management direction and participation during the meetings to evaluate the extent to which management reinforced principles described in the procedures, SPP-10.5, “Plant Operations Review Committee,” Revision 4 and BP-336, “Risk Determination and Risk Management,” Revision 5.

Additionally, the inspectors reviewed the meeting minutes from the three most recent Nuclear Safety Review Board meetings, focusing on the boards review of recent activities to support the recovery and integration of Unit 1 into three unit site operations.

The inspectors assessed the adequacy of nuclear oversight committee activities against the standards in procedure, SPP-3.2, "Nuclear Safety Oversight," Revision 7.

Additional documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

A.2. Management Observation Program

a. Inspection Scope

The inspectors reviewed 208 management observations of selected activities related to Unit 1 recovery, as well as the licensee's planned observations for startup activities that would occur after the inspection, but prior to or during the restart of Unit 1. Additionally, the inspectors interviewed the site general manager and eight department managers, which included the Performance Improvement Manager and Nuclear Assurance Manager, to determine how the management observation program was administered, and what criteria were used to select activities for observation.

The inspectors evaluated the adequacy of the observations reviewed against the expectations and evaluation criteria described in procedures BP-253, "Human Performance Program," Revision 2, and SPP-1.7, "Excellence in Performance Program," Revision 4. The inspectors evaluated the adequacy and timeliness of actions to identify and correct trends from the management observation program against the standards in the licensee's corrective action program, SPP-3.1, "Corrective Action Program," Revision 12. The inspectors also conducted interviews with various craft personnel, operators, maintenance technicians, and system engineers to assess the visibility and effectiveness of the management observation program.

The inspectors reviewed a licensee letter from K. Singer, "Browns Ferry Nuclear (BFN) Unit 1 Restart - Operational Readiness Review (ORR)," dated January 4, 2007, and the associated attachments concerning the results of the ORR and Follow-up assessments, of November and December 2006, respectively. The inspectors reviewed the licensee's corrective actions taken to address the ORR team's recommendations for all eight identified areas for improvement from the assessments. The inspectors assessed both the adequacy and quality of the ORR assessments and the associated corrective actions against procedures SPP-3.1 and BP-344, "Browns Ferry Nuclear Plant Expectations and Responsibilities for Unit-1 Restart," Revision 1.

Additional documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

A.3. Significant Infrequently Performed Tests and/or Evolutions Program

a. Inspection Scope

The inspectors reviewed the documentation of management oversight for three infrequently performed tests, classified as complex activities, conducted during the previous six months. These tests were performed in preparation for startup. During the inspection week there were no tests or activities conducted that met the classification of complex and infrequent.

The inspectors evaluated the designation of the activities as complex against the criteria in the risk-informed plant notebooks, and procedure SPP-8.1, “Conduct of Testing,” Revision 4. The inspectors also verified that the extent of direct management oversight and involvement in the preparation and conduct of the tests was consistent with the expectations given in procedure BP-344.

Additional documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

B. CONTROL OF SAFETY-SIGNIFICANT ACTIVITIES

B.1. System Status Control

a. Inspection Scope

The inspectors evaluated the ability of the licensee to maintain an accurate status of safety-significant plant systems, and the plant operators’ awareness of changes in plant status. The inspectors focused their review on the Unit 1 high pressure coolant injection system, residual heat removal system, standby liquid control system, emergency diesel generator system, and reactor core isolation cooling system.

The inspectors reviewed system configuration log sheets in the main control rooms of Units 1, 2 and 3. The inspectors reviewed two active equipment clearance authorizations and verified accurate placement of the clearance tags. The inspectors performed partial system walkdowns to determine actual system status, including valve and control switch positions, readings of various process indicators such as pressure, temperature, and flow, and accurate component labeling. The inspectors reviewed documentation of six selected operability evaluations, two post maintenance tests, applicable 10 CFR 50.59 screening reviews, and approximately two other surveillance tests.

The inspectors conducted observations of Unit 1 and 2 control room activities and interviewed approximately seven on-shift control room operators to verify that their understanding of current system status, including the reasons for locked in, disabled, or alarming annunciators, was consistent with the documented and inspector observed status. The inspectors observed shift turnover activities for the Unit 1 and 2 control room and the oncoming shift briefing for one day and night shift. The inspectors observed a pre-evolution brief for a scram discharge volume valve test and an infrequently performed condensate system flush operation. The inspectors also observed management oversight activities associated with the surveillance test and the condensate system operation. The inspectors reviewed control room log entries associated with the observed tests and other shift operations, as well as prior entries associated with technical specification equipment and system status changes.

The inspectors evaluated these observations of system status control activities against licensee system operating instructions, system drawings, and management expectations and guidelines as outlined in the following documents:

OPDP-1, “Conduct of Operations,” Revision 8,
OPDP-4, “Annunciator Disablement Sheets,” Revision 4,
1-OI-2, “Condensate System,” Revision 6,
1-OI-74, “Residual Heat Removal System,” Revision 53,
1-SR-3.1.8.2, “Scram Discharge Volume Operability,” Revision 1, and
SPP-10.1, “System Status Control,” Revision 6.

Additional documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

B.2. Configuration Management

a. Inspection Scope

The inspector evaluated the licensee’s maintenance of design configuration for safety significant systems. The inspectors reviewed design documents associated with the high pressure coolant injection system, emergency diesel generators, residual heat removal system, standby liquid control system, and reactor core isolation cooling system.

The inspectors reviewed three recent design change notices (DCN), the control room tracking log of temporary alteration change forms (TACF), and recent control room operator log entries to determine current documented design configuration. The inspectors performed partial system walkdowns and building area tours to compare the as built system configuration with what was indicated in the control room and design records. The inspectors reviewed recent standby liquid control system chemistry sample results for sodium pentaborate concentration and high pressure coolant injection pump oil sample results against design limits. The inspectors reviewed TACF 1-05-004-044 in detail, associated with the reactor building chilled water system.

The inspectors evaluated the as documented and observed plant configuration against the Browns Ferry Updated Final Safety Analysis Report (UFSAR) and Technical Specification requirements.

Additional documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

B.3. Surveillance Testing/Technical Specification Compliance

a. Inspection Scope

The inspectors evaluated the conduct of surveillance activities with respect to procedural compliance, surveillance adequacy, and documentation of results to support Technical Specification operability decisions.

The inspectors observed control room licensed operators conduct pre-evolution briefings and procedure verifications and reviews in preparation for a scram discharge volume valve surveillance test; 1-SR-3.1.8.2. The inspectors observed performance of portions of the surveillance test, including compliance with procedural direction and equipment performance to verify that the test was accomplished in accordance with approved procedures. The inspectors reviewed the applicable test data against the surveillance acceptance criteria. The inspectors verified the test results were appropriately documented, and that they satisfactorily addressed the technical specifications for verification of system operability. The inspector also verified that problems noted during the surveillance were appropriately entered and characterized in the site corrective action program.

The inspectors evaluated the conduct of the surveillance activities against the requirements in the UFSAR and Technical Specifications.

Additional documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

B.4. Control Room Readiness

a. Inspection Scope

The inspectors evaluated the general operational readiness of the Unit 1 main control room, including the operating environment, equipment status, posted operator aids, general housekeeping, operators' attitudes and operating philosophies.

The inspectors performed approximately ten hours of observation and interview activities in the Unit 1 main control room. The inspectors observed general conditions including area lighting, background noise, housekeeping, ventilation, and material condition. The inspectors observed control room annunciators, gages, and other indicators used for control and monitoring of the plant. The inspector observed licensed and non-licensed operators perform routine shift duties, including shift turnovers, clarity and formality of face to face and telephonic communications, procedure usage and adherence, response to annunciators, control board monitoring and component manipulations, pre-job briefings, and documentation of shift activities in the control room log. The inspectors discussed operating philosophy and expectations with the control room operators, and observed conduct of other personnel entering the control room for various daily work activities.

The observations of conduct in the control room were compared to licensee management expectations and guidelines described in OPDP-1.

Additional documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

B.5. Engineering Support for Operations

a. Inspection Scope

The inspectors evaluated the effectiveness of the engineering organization's implementation of engineering programs in support of operational activities associated with incorporation of Unit 1 as an operating facility.

The inspectors interviewed five system engineers, two engineering supervisors, and two engineering department managers to gain an understanding of their job functions, individual responsibilities, and experience and knowledge level. The inspectors reviewed engineering staffing levels, organization charts, and system engineer training records. The inspectors compared the staffing levels and experience to other three unit reactor facilities.

The inspectors attended daily engineering status and management meetings, a weekly system engineering tailgate meeting, and reviewed recent problem evaluation reports (PER). The inspectors reviewed system pre-operability check lists, five system health reports, three system walkdown reports, and the Integration Task Equipment List (ITEL) status reports. During interviews with engineering department personnel, the inspector evaluated the knowledge of the technical staff concerning the current status of Unit 1 system problems.

The inspectors observed the performance of system engineers and technicians in Unit 1 during system and building area walkdowns. The inspectors observed members of the design engineering department during their participation in pre-job briefings, morning status meetings, and a weekly tailgate meeting.

The inspectors evaluated the observations against industry standards, and licensee expectations as described in nuclear engineering department procedure NEDP-20, “Conduct of the Engineering Organization,” Revision 7, and 10 CFR 50, Appendix B.

Additional documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

C. OPERATOR TRAINING AND EXPERIENCE

C.1. Operator Training Program

a. Inspection Scope

The inspectors evaluated the adequacy of incorporation of Unit 1 specific training needs into various site training programs.

The inspectors reviewed the licensed operator requalification, non-licensed operator continuing, and Shift Technical Advisor training programs in detail and sampled areas of maintenance technician, emergency response, and instrumentation and controls technician training programs to evaluate the incorporation of Unit 1 differences from Units 2 and 3. The inspectors interviewed licensee management and operations training personnel to determine the methodology used to determine and revise training program content.

The inspectors reviewed the implementation of completed training and the content of planned training associated with the restart of Unit 1, including just-in-time training. The inspectors observed classroom and simulator sessions of just-in-time training conducted during the inspection week to assess content and training methodology. The inspectors reviewed the training conducted and planned for recently hired employees filling positions in work control that were historically filled with licensed senior operators on Units 2 and 3. The inspectors also reviewed selected records and interviewed personnel to evaluate the effectiveness of unit differences training resulting from recent design changes.

The inspectors evaluated the training programs and their implementation against the standards in the licensee's training program procedure TRN-1, “Administering Training,” Revision 17, and the requirements of 10 CFR 50.120 and § 55.59.

Additional documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

C.2. Unit 1 Differences

a. Inspection Scope

The inspectors reviewed sections of 20 DCNs for Unit 1 risk significant systems to verify significant Unit 1 differences from Units 2 and 3 were accurately incorporated into requalification, continuing, and initial training programs for operations and maintenance department personnel.

The inspectors reviewed procedures associated with Unit 1 differences, including system operating instructions, alarm response procedures, abnormal operating procedures, calibration and surveillance instructions, and emergency operating instructions, to verify appropriate procedure changes were implemented. The inspectors conducted and observed verification and validation of selected abnormal operating instructions and emergency operating procedures in the plant-reference simulator to evaluate the adequacy of the procedure revision process.

The inspectors evaluated the adequacy of the revisions to the licensee training programs against the standards in NUREG-1021, “Operator Licensing Examiner Standards,” Revision 9, and the requirements in 10 CFR 55. The inspectors evaluated the adequacy of the revisions to the reviewed procedures against the requirements in the licensee's Technical Specifications and 10 CFR 50, Appendix B.

Additional documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

C.3. Shift Staffing Qualification and Experience

a. Inspection Scope

The inspectors evaluated the adequacy of current and planned shift staffing for operation of a three unit facility.

The inspectors reviewed training records for all currently licensed operators and shift technical advisors, 12 non-licensed operators, 4 operations department managers, and 12 maintenance technicians. The inspectors also reviewed training records for 12 individuals filling positions on the emergency response organization roster. The inspectors reviewed years of experience and educational background of licensed operators, shift technical advisors and training instructors to assess overall site staff experience.

The inspectors reviewed current and projected numbers of licensed and non-licensed operators available for shift duties, operators in support and emergency response positions, and maintenance personnel. The inspectors interviewed emergency response organization and

operations department management personnel to discuss three unit staffing requirements and personnel availability.

The inspectors evaluated the adequacy of plant staffing to support Unit 1 restart and continued three unit power operation against the requirements in the Technical Specifications, the Site Emergency Plan, and 10 CFR 50.47.

Additional documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

D. CORRECTIVE ACTION PROGRAM

D.1. Effectiveness of Operational Readiness Reviews

a. Inspection Scope

The inspectors reviewed a sample of operational readiness assessments to verify that Unit 1 was properly integrated into three unit operations and to verify that any deficiencies were properly captured in the corrective action program.

The inspectors reviewed seven departmental assessments for identified problems, corrective actions, root cause analysis, and trending and generic applicability of the identified problems. The inspectors interviewed the Operational Readiness Program and Nuclear Assurance managers concerning the methodology used in conducting the assessments. The inspectors reviewed 28 identified problems and areas for improvement from 11 assessments and verified they were appropriately entered into the site corrective action program.

The inspectors evaluated the review results against the requirements of licensee procedures BP-339, “Brown’s Ferry Nuclear Plant Department Readiness Review Process for Unit 1 Restart,” Revision 1, SPP-3.1, and SPP-1.6, “TVAN Self-Assessment Program,” Revision 13.

Additional documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

D.2. Unit 1 Integration into Site Corrective Action Program

a. Inspection Scope

The inspectors reviewed 79 PERs for selected Unit 1 systems to verify that problems arising after system turnovers were properly incorporated into the site corrective action program.

The inspectors attended six management review committee meetings to ensure that Unit 1 problems received appropriate attention. The inspectors reviewed the root cause analysis lesson plans, qualification sheets, and list of qualified individuals to ensure the training program provided for adequate resources to account for Unit 1 activities. The inspectors interviewed the site engineering manager and two operator training instructors to further understand the root cause training program and to ensure there were adequate resources for Unit 1. The inspectors reviewed 20 PERs on the control rod drive system, 20 PERs on the 4kV shutdown boards and 250VDC power systems, 12 PERs on primary containment isolation and main steam systems, and 14 additional PERs not related to any system to verify that the licensee properly identified, evaluated and corrected problems on these systems.

The inspectors evaluated the adequacy of the incorporation of Unit 1 into the site corrective action program against the requirements of procedure SPP-3.1, Technical Specifications, and 10 CFR 50, Appendix B.

Additional documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

D.3. Resolution of Restart Testing and System Turnover Deficiencies.

a. Inspection Scope

The inspectors reviewed the current list of exceptions and deferrals remaining on Unit 1 systems and selected the exceptions identified for three systems to review in detail to verify they were properly dispositioned or incorporated into the corrective action program.

The inspectors reviewed the process for tracking System Preoperability Checklist (SPOC) I and SPOC II exceptions and scheduling them for closure before declaring a system operable. The inspectors reviewed the exceptions identified on the control rod drive, 4kV AC distribution, and 250V DC distribution systems to verify that actions identified in the SPOC process were completed. The inspectors reviewed the documentation for the SPOC I package for the main steam system and walked down the Unit 1 reactor building steam tunnel to verify that deficiencies were properly identified and entered in the site corrective action program. The inspectors reviewed the ITEL punchlist module for the control rod drive, 4kV AC distribution, 250V DC distribution, and main steam systems to verify that no PER conditions were listed as required by procedure 1-TI-439, “Integration Task Equipment List,” Revision 10.

The inspectors evaluated the adequacy of the observations to the requirements of procedure 1-TI-437, “System Return to Service Turnover Process for Unit 1 Restart,” Revision 22 and procedure 1-TI-439. The inspector evaluated the adequacy of the disposition of the exceptions and deferrals against the requirements in procedure 1-TI-319, “Master Refueling Test Instruction,” Revisions 0 and 1, and SPP-3.1.

Additional documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

E. MAINTENANCE SUPPORT ACTIVITIES

E.1. Maintenance Organization

a. Inspection Scope

The inspectors assessed the adequacy of the organization and staffing of the Maintenance Department to support Unit 1 restart and three unit site maintenance.

The inspectors interviewed seven maintenance department managers and supervisors to assess their understanding and application of programs, procedures and processes for integration of Unit 1 into three unit site operations. The inspectors reviewed maintenance focused audits and self-assessment reports and verified that identified problems and areas for improvement were appropriately characterized and entered in the site corrective action program.

The inspectors reviewed the maintenance organizations approved staffing plan in licensee document "Maintenance and Modification Department Approved and Current Headcount." The inspectors interviewed department managers to gain insights concerning management expectations and supervisory oversight, as well as craft personnel responsibilities.

The inspectors reviewed the implementation of the maintenance training program, reviewed maintenance training records, and interviewed selected craft personnel to validate maintenance personnel qualifications. The inspector focused knowledge questions during the interviews on Unit 1 equipment differences from the other operating units.

The inspectors evaluated the adequacy of the maintenance organization staffing and training programs to support three unit operations against applicable industry standards, and the requirements in Technical Specifications and the UFSAR.

Additional documents reviewed are in the Attachment to this report.

b. Findings

No findings of significance were identified.

E.2. Maintenance Effectiveness

a. Inspection Scope

The inspectors assessed the effectiveness of site maintenance during integration of Unit 1 activities.

The inspectors reviewed maintenance program metrics in the April 2007 Maintenance Performance Indicators. The inspectors reviewed in detail the reported maintenance procedure backlogs, preventive maintenance deferrals, elective maintenance backlog, corrective maintenance backlog and repeat maintenance data. The inspectors reviewed nine applicable work orders, surveillance records, ten PERs, three system health reports, and applicable engineering evaluations.

The inspectors reviewed Unit 1 focused maintenance department self-assessments and audits and reviewed the disposition of identified corrective actions associated with maintenance effectiveness. The inspectors attended three plan-of-the-day and four management review committee meetings to observe discussions of work prioritization and classification, and the general impact of integration of Unit 1 work activities into the site maintenance program.

The Predictive Maintenance Manager was interviewed to assess the predictive maintenance program and effectiveness. The inspectors reviewed the Preventive Maintenance Program including schedule, deferrals, equipment failure evaluation and trending, prioritization and the identification and disposition of common cause failures. The inspectors reviewed the April 2007 "Outage/Non-Outage PMs in Grace Period by Priority" report.

The inspectors reviewed five 10 CFR 50.59 safety evaluation screens written to support selected DCN's. The adequacy of the screens was evaluated against procedure SPP-9.4, "10 CFR 50.59, Evaluations of Changes, Tests and Experiments," Revision 7.

The inspectors assessed the effectiveness of maintenance department activities against procedures SPP-6.6, "Maintenance Rule Performance Indicator Monitoring, Trending and Reporting," Revision 9 and SPP-3.1, and 10 CFR 50, Appendix B.

Additional documents reviewed are in the Attachment to this report.

b. Findings

No findings of significance were identified.

E.3. Work Management and Prioritization

a. Inspection Scope

The inspectors conducted field observations, system walkdowns, personnel interviews and documentation reviews to assess work management and prioritization.

The inspectors observed daily schedule and schedule adherence meetings. The inspectors reviewed the procedures for work planning, execution, and documentation. The inspectors interviewed maintenance planning personnel and reviewed maintenance procedures to assure that the following attributes were addressed: (1) procedures contain sufficient detail to perform the work correctly and safely; (2) post maintenance testing was commensurate with the maintenance that was performed; (3) specific planning considerations were addressed; (4) methods and controls for troubleshooting equipment malfunctions; and (5) return of equipment to normal operating status was controlled.

The inspector observed Unit 1 maintenance activities and interviewed the maintenance technicians to verify the activity was performed in compliance with the licensee's procedures. The inspectors also reviewed personnel training and qualification records and verified the current qualification of the observed technicians. The inspectors verified that the appropriate post maintenance test was performed, accurately documented, and that the equipment was returned to service satisfactorily. The inspectors also observed the availability of engineering technical support and supervisory oversight during conduct of the maintenance. Maintenance activities observed are listed in the Attachment. The inspectors evaluated the quality of the maintenance procedures and adequacy of the maintenance performed against the requirements in 10 CFR 50, Appendix B and applicable licensee procedures.

The inspectors reviewed procedures associated with work prioritization and scheduling, on-line work management, emergent work and risk management to assess the programmatic ability to prioritize and schedule work for a three unit site. The inspectors interviewed work week managers to determine how risk insights were applied to work planning for Unit 1, and for the three unit site, especially when emergent problems affected risk significant maintenance activities. The inspectors reviewed licensee maintenance risk assessments and actions taken to plan and control work activities to effectively manage and minimize risk.

The inspectors assessed the adequacy of the application of risk assessments to the scheduling and prioritization of maintenance activities against the requirements in 10 CFR 50.65(a)(4) and the standards in BP-336.

Additional documents reviewed are in the Attachment to this report.

b. Findings

No findings of significance were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On April 27, 2007, the team leader presented the preliminary inspection results to Mr. Swafford, Interim Chief Nuclear Officer, and other members of his staff. On April 30, 2007, following completion of inspection activities on April 28, 2007, the team leader presented an updated briefing of the final inspection results to Mr. B. O'Grady, Site Vice President. The inspectors confirmed that proprietary information was not provided or examined during the inspection period.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

S. Aitken, Operational Readiness Project Manager
S. Armstrong, Performance Analyst
B. Baxter, Electrical Supervisor
S. Berry, Systems Engineering Manager
R. Booher, Schedule Manager
N. Brumfield, Site Nuclear Assurance Manager
D. Burrell, Lead Electrical Engineer, Unit 1
P. Branton, Electrical Supervisor
R. Carter, Maintenance Training Manager
P. Chadwell, Operations Superintendent
J. Corey, Radiation Protection Manager
W. Crouch, Site Licensing & Industry Affairs Manager
R. Davenport, Senior Outage Manager
R. DeLong, Site Engineering Manager
T. Elms, Plant Operations Manager
T. Feltman, Emergency Preparedness Manager
A. Fletcher, Maintenance Superintendent
I. Hillis, Long Cycle Work Week Manager
J. Hopkins, Outage Scheduling Supervisor
M. Hunter, Risk Senior Reactor Operator
R. Jones, Acting Plant Manager
J. Lewis, Senior Manager Operations Integration
G. Little, Unit 1 Plant Restart Manager
D. Matherly, Performance Improvement Manager
J. McCarthy, Licensing Supervisor, Unit 1
T. McGrath, Operational Readiness Senior Project Manager
B. Moll, Manager System Engineering, Restart
D. Newton, I&C Foreman
B. O'Grady, Site Vice President
M. Oliver, Systems/Site Engineering
L. Parvin, Corrective Action Program Contractor
B. Quinn, Work Week Manager
R. Rodgers, Units 2 and 3 Maintenance Modifications
D. Sanchez, Training Manager
J. Schlessel, Unit 1 Maintenance Modification Manager
P. Swafford, Interim Chief Nuclear Officer
J. Underwood, Chemistry and Environmental Superintendent
J. Wallace, Site Licensing Engineer
J. Whitehurst, Predictive Maintenance Manager

LIST OF DOCUMENTS REVIEWED

Section A: Effectiveness of Management Oversight

Self Assessments

BFN-ENG-06-008, "Engineering Snapshot Self-Assessment Report"
BFN-NA-07-SS03, "Snapshot Self-Assessment Report-BFN Nuclear Assurance Department Review of Recent NIEP Findings to Assess Readiness for Three-Unit Operation"
BFN-NA-07-SS05, "Snapshot Self-Assessment Report-BFN Nuclear Assurance Integrated Trend Review: October 2006 - January 2007"
BFN-OPS-07-SS09, "Snapshot Self-Assessment Report-Evaluation of December 2006 EIP Observation Data"
BFN-OPS-07-SS12, "Snapshot Self-Assessment Report-Evaluation of January 2007 EIP Observation Data"
BFN-OPS-07-SS14, "Snapshot Self-Assessment Report-Evaluation of February 2007 EIP Observation Data"

Quality Assurance Reports

NA-CH-06-007, "Assessment of Corporate Organizations' Self Assessments for Certification of Corporate Readiness for BFN U1 Restart and Six Unit Operation"
NA-BF-06-014, "Oversight Report for the Period of January 1, 2006 - March 31, 2006"
NA-BF-06-021, "Oversight Report for the Period of April 1, 2006 - June 30, 2006"
NA-BF-06-028, "Oversight Report for the Period of July 1, 2006 - September 30, 2006"
NA-BF-06-030, "Oversight Report for the Period of October 2, 2006 - November 5, 2006"
NA-BF-06-033, "Oversight Report for the Period of November 6, 2006 - December 10, 2006"
NA-BF-07-002, "Oversight Report for the Period of October 1, 2006 - December 31, 2006"
NA-BF-07-007, "Oversight Report for the Period of January 1, 2007 - March 31, 2007"
"Radiological Emergency Preparedness Program," Audit Report No. SSA0603

Departmental Readiness Reports

CRP-PM-06-002, "BF1 Readiness for the Self Assessment Program," March 27-29, 2006
CRP-PM-06-003, "BF1 Readiness for the Human Performance Program," March 28-29, 2006
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CRP-NFSD-06-001, "Nuclear Fuel Supply & Disposal Readiness to Support BFN U1 Operation," June 15-29, 2006
CRP-PM-06-005, "Corporate Process Methods Department Browns Ferry Unit 1 Readiness," July 26, 2006
CRP-PROJ-06-04, "Project Management Oversight and Governance Readiness for BFN U1 Restart," June 1-26, 2006
CRP-CRS-06-001, "Readiness of the Concerns Resolution Program to Support 6 Unit Operations in the Areas of Responsibility Defined by BP-122," July 6-10, 2006
CRP-TPR-SS-07-001, "Technical Programs Reliability Certification for BFN Readiness for Unit 1 Restart and 3 Unit Operation," October 31, 2006

Procedures

BP-250, "Corrective Action Program Handbook," Revision 12

BP-255, "Operational Decision-Making Issue Evaluation Process," Revision 1
BP-337, "Browns Ferry Nuclear Plant Unit-1 Major Evolution Review," Revision 1
OPDP-9, "Emergent Issue Response," Revision 3
SPP-3.0, "Nuclear Assurance and Licensing," Revision 3

Miscellaneous Documents

W76-060512-825, "Browns Ferry Nuclear Plant (BFN) - Nuclear Assurance (NA) - Three-Unit Operation - NA Oversight Strategy"
Bulletin from Browns Ferry Nuclear Plant, Vol. XXII, No. 13, "Declaration Day 2 Announcement," dated April 19, 2007
BFN Plant Operations Review Committee Agenda and Review Package, dated March 28, 2007
TACF-2-07-001-027, "Temporary Alteration to 2-FCV-27-100"
TVA-Core Operating Limit Report BF1C7R0
L44-060908-001, "Minutes of Meeting No. 296 of the Browns Ferry Nuclear Safety Review Board, August 3-4, 2006," dated September 8, 2006
L44-061214-001, "Meeting No. 297 of the Browns Ferry Nuclear Safety Review Board, November 21, 2006," dated December 14, 2006
L44-070419-001, "Browns Ferry Nuclear Safety Review Board-BFN Unit 1 Restart Readiness, April 11, 2007," dated April 19, 2007
BFN-ENG-06-005, "BFN Engineering Three-Unit Readiness Review Follow-Up
BFN Operations 2007 First Quarter Integrated Trend Analysis Report (01 October 06 - 30 December 06)
BFN Chemistry/Environmental 2007 First Quarter Integrated Trend Analysis Report (October - December 2006)
Letter to K. W. Singer from P. Swafford, "Corporate Certification of Readiness for BROWNS FERRY (BFN) Unit 1 Restart," December 14, 2006
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101113	109723	112628	116882	122380
104313	109884	113049	116598	123909
104317	109992	114232	117379	123894
104319	110066	114301	117557	123871
104320	110110	114652	118150	123928
104321	111818	114972	118188	123780
106893	112103	115033	118901	123926
106894	112326	115104	119628	123880
106895	112327	115667	120591	123936
108974	112343	115898	120928	123971
109597	112347	115979	120984	123906
109602	112367	116105	120985	
109874	112536			

Section B: Control of Safety-Significant Activities

Department Procedures

FPDP-4, "Fire Emergency Response," Revision B1
NEDP-7, "Engineering Support Personnel Training," Revision 14
TPI-207.1, "Training Oversight Committees," Revision 11
TPI-207.2, "TVA Nuclear Training Process Instruction," Revision 1

Test Instructions

O-TI-20, "Control Rod Drive System Testing," Revision 14
O-TI-367, "BFN Equipment to Plant Risk Matrix," Revision 09
1-T1-437, "System Return to Service Turnover Process for Unit 1," Revision 22

Operating Instructions

0-OI-30F, "Common and Diesel Generator Building Ventilation," Revision 27
0-OI-57A, "Switchyard and 4160V AC Electrical System," Revision 118
1-OI-1, "Main Steam System," Revision 1
1-OI-3, "Reactor Feedwater System," Revision 5
1-OI-23, "Condensate Demineralizer System," Revision 1
1-OI-63, "Standby Liquid Control system," Revision 1
1-OI-71, "Reactor Core Isolation Cooling System," Revision 2
1-OI-73, "High Pressure Coolant Injection System," Revision 4
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68019	106084	114482	119221	120457
77006	108879	114493	119221	120528
77006	108879	115403	119625	120936
90250	111642	115872	119637	122099
91642	113301	118629	119745	122211
96035	113860	118783	120099	122724
101585	113860	118884	120099	123975
101868	114037	119057	120195	
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Mobile DTE 790 Data Sheet
NUREG/CR-6022 BNL-NUREG-52370, "High Pressure Coolant Injection (HPCI) System Risk-based Inspection Guide for Browns Ferry Nuclear Power Station"
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ODM-4.10, "Operations Record Control," Revision 2
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BFN WCCSROD/OSUS, Qualification Card
EPT 101.000, Site Emergency Director
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OTG-15 Weekly simulator Performance, Revision 5
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ICT 103.032 Instrument Maintenance Training
JIT Training, Unit 2 Reactor Recirculating Water Pump Start, 4/24/2007
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OPL 171.009, MSIV Poppet Stem
OPL 171.011, Condensate Upgrade
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OPL 171.054, Condensate Upgrade
OPL 171.151, Unit 1 Recovery/ EPU DCN Modifications, Revision 0.
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OPL 173R219, Welcome to Requal Cycle 6, 2006
OPL 175S003, Dual Unit Simulator Exercise Guide

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1-AOI-3-1, "Loss of Reactor Feedwater or Water Level High/Low," Revision 0
1-AOI-68-1A' "Reactor Recirculating Pump Trip/Core Flow Decrease OPRMS Operable," Revision 2
1-AOI-100-1, "Reactor Scram," Revision 1

1-EOI Appendix-1B, "Venting and Repressurizing the Scram Pilot Air header," Revision 0
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1-EOI Appendix-19, "H2/O2 Analyzer Operation," Revision 0
1-EOI-3. "Secondary Containment Control," Revision 0
1-EOI-2, "Primary Containment Control," Revision 0
EPIP-1 "Emergency Classification Procedure, Event Classification Matrix," Revision 42
1-OI-1, "Main Steam System," Revision 1
1-OI-1, "Attachment 4, Instrument Inspection Checklist," Revision 0
1-OI-3, "Reactor Feedwater System," Revision 5
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0-OI-23, "Residual Heat Removal Service Water System," Revision 76
0-OI-55, "Annunciator System," Revision 42
0-OI-57A, "Switchyard and 4160V AC Electrical System," Revision 118
OPDP-1, "Attachment L, Operator Workaround," Revision 8
SPP-9.5, "Temporary Alterations," Revision 14
SPP-10.3, "Verification Program," Revision 1
1-TI-331, "Post Accident Sampling," Revision 3,
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0-TI-405, "Plant Modifications and Design Change Control," Revision 0
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51106	51139	51185	51231	51478
51136	51143	51197	51240	66071
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Letter from T.E. Abney (TVA) to NRC dated February 19, 2003, "Technical Specifications (TS) Change 423 - Eliminate Requirements for Post Accident Sampling System"
Regulatory Guide 1.97, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," Revision 3
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Radiological Emergency Personnel Callout List, 4/12/07
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1-XA-55-6A, Alarm Response Procedure (ARP), Window 12, 13, 14, 19, 20, 21
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1-SIMI-2C, "Condensate System Calibration Data Sheets (Booster Pump 1A OIL, 1-PS-2-135, 136, 137)," Revision 23

1-SIMI-67B, "Scaling and Setpoint Document," Revision 6,
1-SIMI-73B, "HPCI System Scaling and Setpoint Documents (1-PS-73-1A, 1B, 1C, 1D," Revision 11
Drawings 1-47E804-1, 1-47E859-1, 2-47E804-1, 1-47E833-1, 1-47E867-3, 1-796E864-2 and -3
TVA-BFN-TS-459, License Amendment Letter

Section D. Corrective Action Program

Self Assessments

Brown's Ferry Nuclear Unit 1 Restart Operational Readiness Review, dated January 4, 2007
BFN-AIM-06-001, Self-Assessment Report
BFN-AIM-06-002, Self-Assessment Report
BFN-CEM-06-001, Self-Assessment Report
BFN-CEM-06-003, Self-Assessment Followup
BFN-OPS-06-004, Operations readiness for 3 Unit Operation
BFN-OPS-06-005, BFN Operations Department 3 Unit Readiness Follow-up Self-Assessment
BFN-SIT-06-001, Corrective Action Program Assessment – 3 Unit Operational Readiness
BFN-SCH-06-003, R3, Self-assessment Report
CRP-PM-06-001, "Browns Ferry Unit 1 Readiness for the Corrective Action Program," March 27-29, 2006

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50299	98587	104240	109992	116598
60784	100803	104339	110110	116792
61026	100805	104566	110194	117017
64978	100809	104626	110243	117046
70046	100810	105159	110245	117339
79702	100811	105458	110431	118132
89577	100814	105506	110822	118401
89621	101108	105537	110926	119213
93786	101111	106209	112345	120220
94991	101400	106880	113245	120591
94993	101516	106902	113358	121750
94997	101795	107105	114318	123175
95718	101868	107515	115040	123182
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BP-125, "Corporate Certification of Operational Readiness for BFN U1 Restart," Revision 2
CAT 012, "Corrective Action Training Program, Root Cause Analysis," Revision 2
Drawing 1-47E610-68-1

Section E: Maintenance Support Activities

Self Assessments

BFN-M&M-06-C04 & 05, "Maintenance & Mods Department Readiness for Unit 1 Restart and 3 Unit Operation"
CRP-NOPS-06-001, "Readiness of Corporate Nuclear Operations to Support BFN U-1 Restart and 3 Unit Operation," June 30, 2006
CRP-BUS-06-001, "BFN-1 Restart Self Assessment for TVAN Business Monitoring and Analysis and TVAN Site/Field Business Services," June 16-20, 2006
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EII-0-000-TCC106, "Troubleshooting, Documentation and Configuration Control of Electrical Activities," Revision 58
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MMDP-3, "Guidelines for Planning and Execution of Troubleshooting Activities," Revision 3
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SPP-6.1, "Work Order Process Initiation," Revision 4
SPP-6.3, "Pre-/Post-Maintenance Testing," Revision 2
SPP-7.1, "On Line Work Management," Revision 9
0-TI-367, "BFN Equipment to Plant Risk Matrix," Revision 9

Scheduling and Planning Documents

BFN -Daily Work Week Schedule for April 23-29, 2007
BFN - 3 Unit 12 Week Rolling Schedule
BFN Transition Plan for 3 Unit Operation
Browns Ferry Nuclear Plant U1C6 Recovery Outage, dated April 23, 2007
Outage/Non-Outage PMs in Grace Period Sorted by Priority dated, April 25, 2007
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101927	102892	110968	
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ANSI/ANS-3.2-1971, "Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants"
BFN Maintenance Performance Indicators
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